Name of Organization: USGS

Type of Organization: Federal Agency

Contact Information: Dr. Chris Ingersoll

USGS

4200 New Haven Rd.

Columbia MO 65201

Phone: (573) 876 - 1819 **Extension:**

Fax: (573) 876 - 1896

E-Mail: chris_ingersoll@usgs.gov

Project Title: Criticial evaluation of whole-sediment toxicity test

Project Category: Contaminated Sediments

Rank by Organization (if applicable): 0

Total Funding Requested ($): 25,000 **Project Duration:** 1 Years

Abstract:

The objective of this research will be to critically evaluate the sensitivity of whole-sediment toxicity tests with the amphipod Hyalella azteca and the midge Chironomus tentans. Both acute (10-d) and chronic (42- to 60-d) toxicity tests have recently been standardized for these two test organisms through EPA and ASTM. Endpoint measured in these tests include survival, growth, reproduction, or emergence. A report would be developed which would evaluate the relative sensitivity of endpoints recommended in these methods. This evaluation would focus on compiling information from the published literature on the sensitivity of these species to contaminants. We would also use a recently developed database of matching sediment chemistry and toxicity to evaluate the sensitivity of endpoints in these tests. We would also critically evaluate approaches for establishing toxic effects in these tests (i.e., ANOVA vs minimal detectable differences). Results of this evaluate would allow for a more efficient application of acute and chronic sediment toxicity tests to assess contaminanted sediment issues in the Great Lakes.

Geographic Areas Affected by the Project

States:

- [x] Illinois
- [x] Indiana
- [x] Michigan
- [x] Minnesota
- [x] New York
- [x] Pennsylvania
- [x] Wisconsin
- [x] Ohio

Lakes:

- [ ] Superior
- [ ] Huron
- [ ] Michigan
- [ ] Erie
- [ ] Ontario
- [x] All Lakes

Geographic Initiatives:

- [ ] Greater Chicago
- [ ] NE Ohio
- [ ] NW Indiana
- [ ] SE Michigan
- [ ] Lake St. Clair

Primary Affected Area of Concern: All AOCs

Other Affected Areas of Concern:

For Habitat Projects Only:

Primary Affected Biodiversity Investment Area: Not Applicable

Other Affected Biodiversity Investment Areas:

Problem Statement:

The objective of this research will be to critically evaluate the sensitivity of whole-sediment toxicity tests with the amphipod Hyalella azteca and the midge Chironomus tentans. Both acute (10-d) and chronic (42- to 60-d) toxicity tests have recently been standardized for these two test organisms through EPA and ASTM. Endpoint measured in these tests include survival, growth, reproduction, or emergence. There is a need for a comprehesive summary of the relative sensitivity of the endpoints measured in these tests. Burton et al. (1996; A comparison of sediment toxicity test methods at three Great Lakes Areas of Concern. J Great Lakes Res 22:495-511) performed this type of an analysis for all of the data generated as part of the GLNPO ARCS project for multiple species. However, there has been substantially more data generated since the completion of the ARCS project that can be used to more throughly evaluate the utility of conducting acute or chronic sediment toxicity tests with amphipods and midges in the Great Lakes.

Proposed Work Outcome:

A report would be developed which would evaluate the relative sensitivity of endpoints recommended in standard methods for conducting whole-sediment toxicity tests with amphipods and midges. This evaluation would focus on compiling information from the published literature on the sensitivity of these species to contaminants. We would also use a recently developed database of matching sediment chemistry and toxicity to evaluate the sensitivity of endpoints in these tests. We would also critically evaluate approaches for establishing toxic effects in these tests (i.e., ANOVA vs minimal detectable differences). Results of this evaluate would allow for a more efficient application of acute and chronic sediment toxicity tests to assess contaminanted sediment problems in the Great Lakes.

Project Milestones:	**Dates:**
Project Start	06/2000
Comilation of information	09/2000
Complet draft report	12/2000
Complete final report	03/2001
	/
	/
	/
Project End	03/2001

☐ Project Addresses Environmental Justice

If So, Description of How:

☐ Project Addresses Education/Outreach

If So, Description of How:

Project Budget:

	Federal Share Requested ($)	Applicant's Share ($)
Personnel:	13,714	20,000
Fringe:	5,879	0
Travel:	0	0
Equipment:	0	0
Supplies:	0	0
Contracts:	0	0
Construction:	0	0
Other:	0	0
Total Direct Costs:	19,593	20,000
Indirect Costs:	5,407	0
Total:	25,000	20,000
Projected Income:	0	0

Funding by Other Organizations (Names, Amounts, Description of Commitments):

None

Description of Collaboration/Community Based Support:

This collaboration would be in the form of working with public, private, and independent groups in identifying potential databases to be included the evaluation of the sensitivity of the whole-sediment toxicity tests with the amphipod Hyalella azteca and the midge Chironomus tentans. This project will involve the collabration between MacDonald Environmental Sciences Ltd. (Don MacDonald), USGS (Chris Ingersoll, Columbia, MO), NOAA (Jay Field, Seattle, WA), and USEPA (Dave Mount, Duluth, MN).